REMARKS

Claims 1-31 were presented for examination and were pending in this application. In an Official Action dated February 12, 2004, claims 1-31 were rejected. Applicants thank Examiner for examination of the claims pending in this application and address Examiner's comments below.

In the 3rd paragraph of the Office Action, Examiner rejects claims 1-11, and 13-31 under 35 USC § 103(a) as allegedly being unpatentable in view of U.S. Patent No. 6,170,025 to Drottar et al. ("Drottar") and U.S. Patent No. 6,148,414 to Brown et al. ("Brown"). Applicants traverse this rejection with respect to claims 1-8, 10, 13-25, and 29-31. Applicants further amend claims 9 and 26 and cancel claims 11, 27, and 28 without prejudice.

In the 22nd paragraph of the Office Action, Examiner rejects claim 12 under 35 USC § 103(a) as allegedly being unpatentable in view of Drottar, Brown and U.S. Patent No. 6,243,781 to Gandhi et al. ("Gandhi"). This rejection is respectfully traversed.

To render a claim unpatentable under § 103, the prior art must teach or suggest *each and every* limitation in the claim. MPEP § 2143.03; *see also In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988) (reversing § 103 rejection because examiner ignored material claimed limitation that was absent from reference); *In re Royka*, 490 F.2d 981 (CCPA 1974). The Examiner's rejection of claims 1-31 was improper because his suggested combination of Drottar in view of Brown does not teach or suggest all of the limitations of the rejected claims.

Turning now to independent claim 1, it recites:

> A method for communicating transaction request information from a PCI environment over a network, the method comprising:
> receiving a number of transaction requests from the PCI environment;
> determining a destination node ID and a destination address associated with each transaction request;
> maintaining an order of the transaction requests received;
> **maintaining an order of data associated with each of the transaction requests;**
> for each transaction request, assembling a packet including a request, a destination node ID and a destination address; and
> transmitting the packet to the network. (Emphasis added).

The claimed invention, as recited in claim 1, receives transaction requests from the PCI environment and determines a destination node ID and address associated with each request. The claimed invention maintains an order of the received transaction requests and an order of data associated with each of the request. The claimed invention then assembles a packet that includes a request, a destination node ID and a destination address. The assembled packet is transmitted over the network. Claim 16 recites a system adapted to perform similar steps.

Drottar does not disclose or suggest the claimed invention. Although Drottar discloses "a method of executing a locked transaction over a distributed computer system to a remotely located I/O resource" (col. 1, lines 60-65), Drottar does not disclose or suggest "maintaining an order of data associated with each of the transaction requests," as claimed. The Examiner cited col. 12, lines 19-22 of Drottar for the disclosure of this claimed feature. However, the cited portion of the reference, as well as the surrounding lines, fails to disclose the

claimed feature. Rather, Drottar discloses at col. 12, lines 19-22 ordering packets before transmitting them to the destination:

> "Packets are ordered strongly while sharing the physical queue structure within each interface. The NG I/O protocol guarantees multiple packets in a given sequence from one source will arrive in order to one destination."

Thus, Drottar merely orders packets that have already been assembled for routing over a network. Ordering packets before routing them over a network is a conventional way of transmitting packets over the network. This is not what the Applicants claim. In contrast to Drottar, the claimed invention maintains "an order of data associated with each of the transaction requests" before the packet is assembled. Data, which can be read or write data, is assembled into a packet along with a destination node ID and a destination address. The assembled packet is transmitted over the network. Hence, the claimed invention maintains an order of the data prior to creating a packet, whereas Drottar maintains an order of packets that have been assembled to be transmitted over the network. Maintaining **an order of the data** associated with each transaction request **before the packet is assembled** is different from maintaining **an order of the packets** that have already been assembled to be delivered to a destination address. Accordingly, for at least the above reasons, Drottar does not disclose or suggest the claimed invention, as recited in claims 1 and 16.

Moreover, Brown fails to remedy the deficiency of Drottar. Brown discloses an arbitration process in which Array Management Functions (AMFs) request a lock for a particular resource. Brown, however, fails to disclose or

suggest "maintaining an order of data associated with each of the transaction requests." Rather, at col. 17, lines 1-11, Brown discloses that each lock request is queued in an arbitration queue:

> "The requests are processed in some order such that all requests are satisfied in priority order. The request queue priority is established through any well-known algorithm (e.g., FIFO, LIFO)."

Thus, Brown merely maintains a queue of lock requests, whereas the claimed invention maintains an order of data associated with each transaction request. Accordingly, for at least the above reasons, Brown does not disclose or suggest the claimed invention, as recited in claims 1 and 16.

Thus, since neither of the references discloses or suggests "maintaining an order of data associated with each of the transaction requests," the combination of the references does not disclose or suggest the claimed feature. Accordingly, a person of ordinary skill in the art considering the teachings of Drottar and Brown, either alone or in combination, would not find the features recited in claims 1 and 16 obvious.

Claims 2-8 and 17-25 depend either directly or indirectly from independent claims 1 and 16 respectively and derive their patentability from the independent claim from which they depend, in addition to reciting their patentable features.

For example, claim 3 depends from claim 1 and recites that the step of determining a destination node ID and a destination address further includes "mapping a remote DMA space from a logical node ID included in a PCI address

space of the PCI environment, the DMA space corresponding to a number of remote memory devices." The Examiner cited col. 14 and col. 18, lines 38-42 of Drottar for the disclosure of this claimed feature. The cited portions of the reference, however, fail to disclose the claimed feature. More specifically, Drottar discloses at col. 18, lines 38-42:

> "The NG I/O/PCI bridge 320 maps the PCI address of the transaction to a specific network address (identifying the target host computer 310) and the corresponding host memory address using a local I/O memory map."

The cited portion of Drottar makes it clear that Drottar determines a destination address by mapping the PCI address of the transaction to a specific network address. The reference, however, does not disclose any specifics on how the destination node ID and address are determined. Thus, the reference does not disclose or suggest "mapping a remote DMA space **from a logical node ID** included in a PCI address space," as claimed (emphasis added). Moreover, Brown fails to cure the deficiency of Drottar. Indeed, Brown is not even concerned with determining a destination address associated with each transaction request. All Brown discloses is an arbitration process by which Array Management Functions request a lock for a particular resource. Thus, for at least these reasons, claim 3 is patentable over Drottar and Brown, both alone and in combination.

Claim 7 depends from claim 1 and further recites: "determining a number of transaction requests that have a same destination address." The Examiner cites col. 20, lines 20-24 of Drottar for the disclosure of this claimed feature. The cited passage, however, discloses:

> "When the current read transaction is received at bridge 320, the bridge 320 compares the PCI address of the current transaction to PCI addresses of any locked resources to determine if the resource is locked."

Thus, although Drottar compares the PCI address of the current transaction to PCI addresses of any locked resources, nowhere does Drottar disclose "determining a number of transaction requests that have a same destination address, " as claimed. Again, Brown fails to cure the deficiency of Drottar because Brown only discloses an arbitration process by which Array Management Functions request a lock for a particular resource. Thus, claim 7 is also patentable over Drottar and Brown for at least these reasons.

Claim 8 depends on claim 1 and further recites that the step of determining a destination node ID and a destination address associated with each request includes: "deriving the destination node ID from a node ID table, each entry in the table indexed according to a logical node ID included in a PCI address space of the PCI environment." This technique is advantageous because it provides an additional level of abstraction between the local PCI address and the destination node ID, thereby providing greater scalability. The Examiner cited col. 18, lines 38-42 of Drottar for the disclosure of this claimed feature. The cited passage, however, discloses:

> "At step 815, the NG I/O/PCI bridge 320 maps the PCI address of the transaction to a specific network address (identifying the target host computer 310) and the corresponding host memory address using a local I/O memory map."

Thus, Drottar merely discloses mapping the PCI address of the transaction to a network address. Neither the cited passage nor the lines surrounding the cited passage disclose any specifics on how a destination node ID is determined. Hence, Drottar does not disclose or suggest the claimed step. Brown similarly fails to cure the deficiency of Drottar. As previously described, Brown is not even concerned with determining a destination address of a transaction request. All Brown is concerned with is a mechanism by which Array Management Functions arbitrate to request a lock for a particular resource. Therefore, Applicants respectfully submit that claim 8 is patentable over Drottar and Brown for at least these reasons.

Referring now to amended independent claim 9, it recites *inter alia*:

> A method for communicating request packet information from a network to a PCI environment, the method comprising:
> ...
> maintaining an order of the requests associated with each of the request packets received;
> maintaining an order of data associated with each of the request packets received; and
> for each request packet, processing the associated request,
> **wherein maintaining the order of the requests and maintaining the order of data are accomplished using a first FIFO queue structure for read data, a second FIFO queue structure for write data and a third FIFO queue structure for the requests.** (Emphasis added).

Claim 9, as amended, recites a method for communicating request packet information from a network to PCI environment. In particular, a number of request packets are received from the network and a request, destination node ID and address are identified. The claimed invention maintains an order of the

requests and order of data associated with each of the request packets received using FIFO queue structures. Amended claim 26 recites a system adapted to function accordingly.

Drottar fails to disclose or suggest the claimed invention, as recited in claim 9. For example, Drottar does not disclose or suggest at least the step of "maintaining the order of the requests and maintaining the order of data are accomplished using a first FIFO queue structure for read data, a second FIFO queue structure for write data and a third FIFO queue structure for the requests." As previously discussed, there is only one passage in Drottar at col. 12, lines 19-24 where it discusses packet ordering. Drottar orders packets that have already been assembled for destination over a network. Drottar, however, does not disclose or suggest any FIFO queue structure for maintaining an order or the requests and maintaining the order of read and write data associated with each request packet. Accordingly, for at least the above reasons, Drottar does not disclose or suggest the claimed invention as recited in claims 9 and 26.

Moreover, Brown fails to remedy the deficiency of Drottar. The Examiner cited col. 17, lines 1-11 of Brown for the disclosure of the claimed feature. The cited portion of the reference, however, fails to disclose the claimed invention. More specifically, Brown discloses at col. 17, lines 1-11:

> "The requests are processed in some order such that all requests are satisfied in priority order. The request queue priority is established through any well-known algorithm (e.g. FIFO, LIFO)."

Thus, the cited paragraph merely discloses maintaining the order of requests using well-known algorithms, such as FIFO or LIFO. Brown does not disclose or suggest maintaining an order of data associated with each request packet. As a corollary to this, Brown cannot disclose or suggest any specifics on how the order of the data is maintained. Thus, Brown fails to disclose or suggest the step of "maintaining the order of data are accomplished using a first FIFO queue structure for read data, a second FIFO queue structure for write data ..." Accordingly, claims 9 and 26 are patentable over the combination of Drottar and Brown for at least the above reasons.

Since neither of the references discloses or suggests "maintaining the order of the requests and maintaining the order of data are accomplished using a first FIFO queue structure for read data, a second FIFO queue structure for write data and a third FIFO queue structure for the requests," a person of ordinary skill in the art considering the teachings of Drottar and Brown, either alone or in combination, would not find the features recited in claims 9 and 26 obvious.

Claims 10, 12-15, and 29-31 depend either directly or indirectly from independent claims 9 and 26 and derive their patentability from the independent claim from which they depend, in addition to reciting their patentable features.

Conclusion

In sum, Applicants respectfully submit that claims 1-10, 12-26 and 29-31, as presented herein, are patentably distinguishable over the cited references (including references cited, but not applied). Therefore, Applicants request reconsideration of the basis for the rejections to these claims and request

allowance of them. In addition, Applicants respectfully invite Examiner to contact Applicants' representative at the number provided below if Examiner believes it will help expedite furtherance of this application.

Respectfully Submitted,
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